

## A NEW MEXICAN SPECIES OF *GASTRISUS* (COLEOPTERA: STAPHYLINIDAE)<sup>1</sup>

Jose Luis Navarrete-Heredia<sup>2</sup>, Juan Marquez<sup>3</sup>

**ABSTRACT:** *Gastrisus newtonorum*, new species, is described based on specimens from the states of Mexico, Guerrero, Jalisco and Morelos. One specimen was examined by Bernhauer, however it was misidentified as *G. mimetes* Sharp. The Mexican record of *G. mimetes* in Bernhauer and Schubert's and Blackwelder's catalogs was probably based on this misidentification. The two species are compared, and the aedeagi are illustrated. Distributional and biological data are provided.

*Gastrisus* Sharp, 1876 is an American genus, with most species in South America. At present, 19 species are recognized: Blackwelder (1944) cited 12 species; Scheerpeltz (1972) moved six species from *Trigonopselaphus* to this genus; and one more is described here.

*Gastrisus mimetes* Sharp was described based on a single specimen from Costa Rica (Sharp, 1884: 360). Years later, Bernhauer and Schubert (1914) and Blackwelder (1944) recorded this species from Mexico. However, we do not know if the Mexican record was ever published elsewhere. Bernhauer (1912: 39) in his description of *G. venezolanus* mentioned that he had identified the holotype earlier as *G. mimetes*, and that he was comparing it to specimens of *G. mimetes* from Colombia and Peru (country records not included in the catalogs cited above).

One specimen from Guerrero (at FMNH), identified by Bernhauer as *G. mimetes* belongs to an undescribed species. This situation was first recognized by A.F. Newton, Jr. who compared one specimen from Guerrero with the holotype of *G. mimetes* at BMNH (see material examined). Later, he received specimens from G. Ruiz-Lizárraga and L. E. Rivera collected in Guerrero and Jalisco respectively, that he identified as *Gastrisus* n. sp.

Ruiz-Lizárraga (1993), in her excellent contribution on carrion staphylinids, provided descriptions of the species that she collected, and included one for *Gastrisus* n. sp. From that date until now this species has awaited formal description. Upon request, Dr. Newton kindly sent us specimens of the undescribed species from FMNH and four *G. mimetes* from Costa Rica to support this work. Also, Miss G. Ruiz-Lizárraga allowed us to describe this species. The goal of this paper is to describe and provide biological data on this new species.

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<sup>2</sup> Entomología, Centro de Estudios en Zoología, CUCBA, Universidad de Guadalajara, Apdo. Postal 234, 45100 Zapopan, Jalisco, México.

<sup>3</sup> Lab. de Morfofisiología Animal, Fac. de Ciencias, UNAM, 04510, México, D.F.

## MATERIALS AND METHODS

Specimens for this study were borrowed from: Field Museum of Natural History, Chicago (FMNH); Colección Entomológica, Escuela Nacional de Estudios Profesionales, Iztacala (ENEPI); and Colección Entomológica, Universidad de Costa Rica (UCR); others were collected by the authors during their research. Acronyms for collections where type material will be deposited are: American Museum of Natural History, New York (AMNH); British Museum, London (BMNH); Canadian National Collection, Ottawa (CNC); Entomología, Centro de Estudios en Zoología, Universidad de Guadalajara, Zapopan (CZUG); Instituto de Biología, UNAM, D.F. (IBUNAM); Snow Entomological Museum, Lawrence, Kansas (SEM); Laboratorio Especializado de Morfofisiología Animal, Fac. de Ciencias, UNAM, D.F. (LEMA); Juan Márquez Luna Collection, D.F. (JML); Jose Luis Navarrete Collection, Zapopan (JLN); and Museo de Historia Natural Ciudad de Mexico, D.F. (MHNCM).

Throughout this paper we refer to abdominal segments by their morphologically comparable names and use roman numerals for these. The first fully visible segment is segment III. Tergum II is usually narrowly visible. Total length was measured from the anterior margin of the head to the apex of abdominal segment IX.

*Gastrisus newtonorum* Navarrete and Márquez, NEW SPECIES

Figs. 1, 2, 4, 5, 8.

**HOLOTYPE MALE:** Length 15.6 mm. Black, except abdominal segments VII-IX, last segment of maxillary and labial palpi, and tarsi rufotestaceous. Surface covered with microsculpture consisting of isodiametric meshes, mixed with scattered micropunctures; tempora with irregular waves; neck and abdominal segments with dual microsculpture: isodiametric meshes at base and irregular waves on apical portion (more distinct on segments VII-VIII).

Head subquadrate; setiferous punctures denser at posterior angles and along medial borders of eyes, dorsal surface without setiferous punctures (Fig. 2). With subocular ridge. First antennal segment slightly shorter than next two segments combined, second segment shorter than third segment; fifth to eleventh transverse, large setae decreasing in number but short setae more conspicuous. Second and third segments of maxillary palpi broader at apex, last segment elongate, subcylindrical, as long as second segment. Last segment of labial palpi as broad as penultimate segment and as long as last segment of maxillary palpi. Mandibles subequal in length to head along midline. Right mandible with a tooth opposite an emargination of left mandible. Gular sutures confluent at middle. Neck with oblique longitudinal line dorsolaterally on each side.

Pronotum slightly larger than head; narrowed toward base; anterior angles rectangular, basal angles obtuse; setiferous punctures scattered, denser at sides, dorsal punctures 3:3, asymmetrical; postcoxal process of the hypomeron translucent. Elytra opaque, with numerous setiferous punctures, with two humeral macrosetae and one near scutellum. Two macrosetae on anterior middle of prosternum. Tibiae with spines, denser on mesotibiae. First four segments of anterior tarsi dilated, as broad as anterior tibiae, with modified pale setae ventrally; last segment as long as previous three segments combined. Middle and hind tarsi similar: first segment as long as following three segments combined, last segment as long as previous two segments combined.

Abdominal segments as shining as head and pronotum; tergites III-IV with impressed line

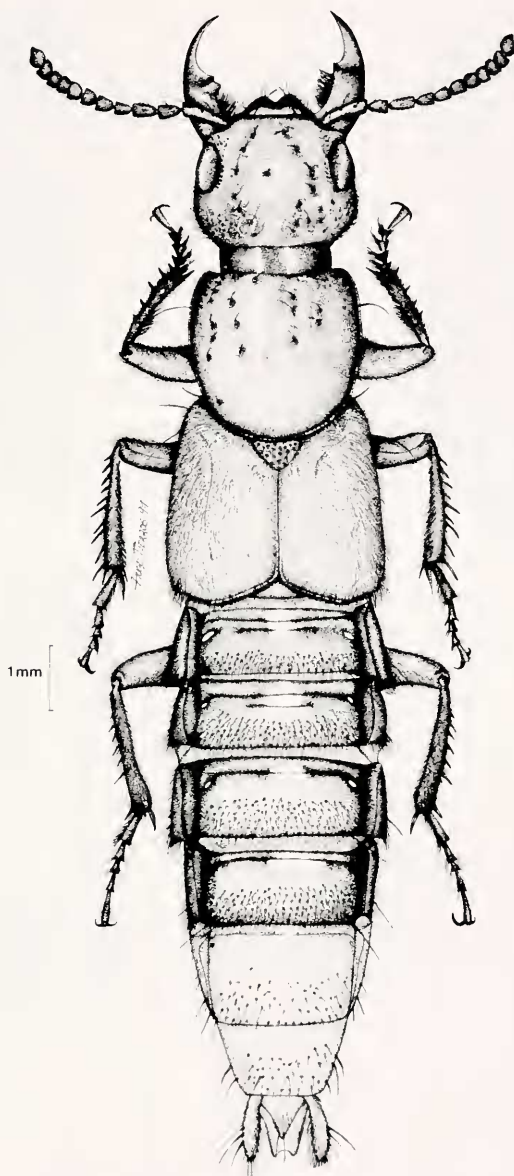
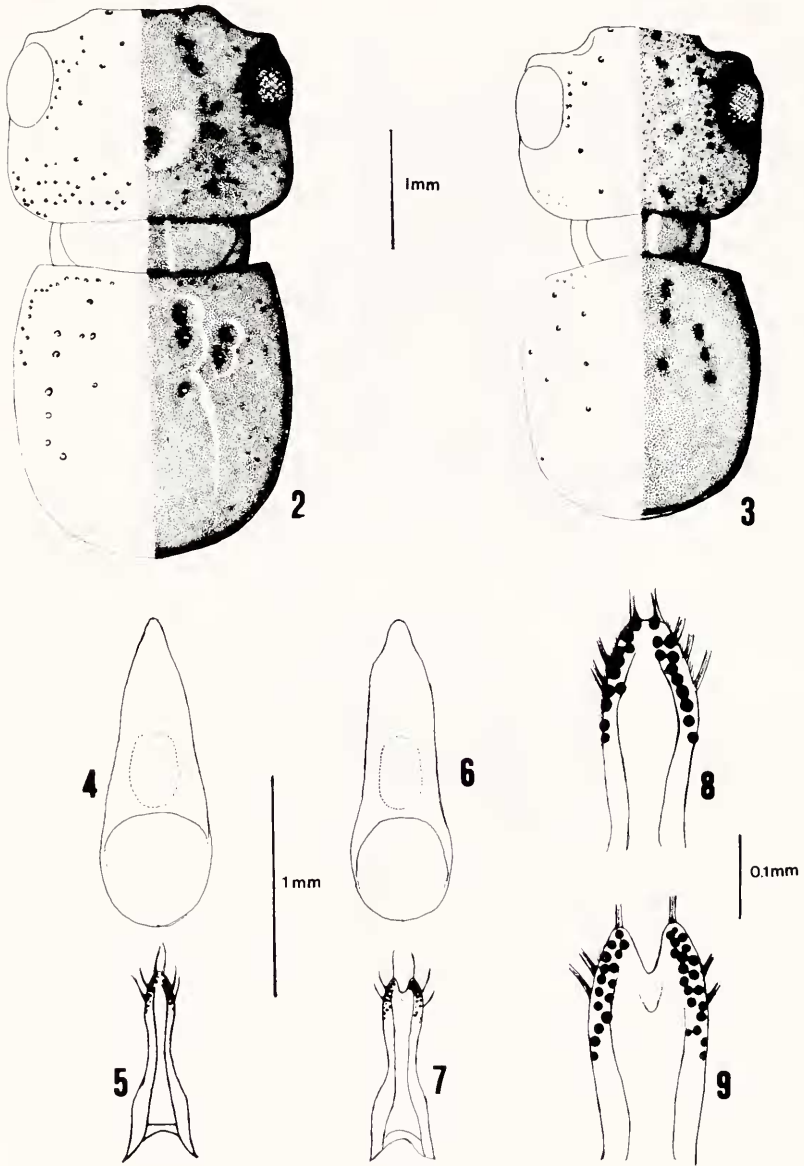


Figure 1. Dorsal view of *Gastrisus newtonorum* Navarrete and Márquez, new species.



Figures 2-9. Morphology of *Gastrisus* spp. *G. newtonorum*: 2. Head and pronotum, 4. Aedeagus (parameres removed), 5. Paramere, 8. Distribution of peg setae on paramere. *G. mimites*: 3. Head and pronotum, 6. Aedeagus (paramere removed), 7. Paramere, 9. Distribution of peg setae on paramere.

on basal portion. One black macroseta on each side of posterior border of terga III-VI. Sternite VII slightly emarginate at middle; VIII with conspicuous triangular emargination; sternites VII-VIII with three black macrosetae on each side. Sternite IX emarginate, with two black macrosetae. Aedeagus as in Figs. 4-5, 8. Paramere with apex almost reaching apex of medial lobe.

**ALLOTYPE FEMALE:** Length 14.1 mm. Similar to holotype, except for: head narrower; first four segments of anterior tarsi slightly less dilated; dorsal setiferous punctures on pronotum 4:4, asymmetrical; abdominal sternites VII-VIII not emarginate, sternite IX with two rufous macrosetae on apex, in addition to two black ones.

**Variation:** Length 11.9-15.6 mm. Specimens from Guerrero are mostly paler, primarily on prothorax where borders are reddish brown, and with abdominal segments VII-VIII yellow. Also, one specimen examined by Ruiz-Lizárraga (1993) and five examined by us have abdominal segments VII-VIII dark reddish brown. Aedeagi of these specimens are black, their dark color pattern is likely caused by the mixture of liquids used as killing agents. A few specimens have the pronotum and elytra apparently green in dorsal view. One specimen from Morelos has the last segment of the right maxillary palpus black. Dorsal punctures on the pronotum are highly variable: 2:3, 3:3, 3:4, 3:5, 4:2, 4:3, 4:4, 4:5; in some specimens, the last puncture is on the posterior half of the pronotum. The peg setae on the paramere are slightly variable in number.

**MATERIAL EXAMINED:** **Holotype:** MEXICO: MORELOS, Yauatepec, Carretera México-Cuautla, km. 19. Selva baja caducifolia. ex excremento. 16-JUN-1996. J. Márquez col. **Allotype:** Tlayacapan, camino a Sta. Catarina. Selva baja caducifolia. Zona 4, 1534 msnm. 1 al 30-VI-1996. ex NTP-80 (calamar). J. Márquez col.

**Paratypes:** MEXICO: MORELOS, Tlayacapan. 31-X-1992. ex excremento vacuno. J. Márquez col. (1♂). Same data except for: 27-VIII-1995. I. Sánchez y J. Márquez cols. (2♂). Same data except for: zona 5, cultivo de temporal y selva baja caducifolia. 1 al 30-VII-1995, ex NTP-80. J. Márquez col. (2♂, 1♀). Same data except for: 1 al 30-IX-1996 (1♀). Same data except for: 1 al 30-VI-1996 (8♂). Tlayacapan, camino a Sta. Catarina, zona 4, selva baja caducifolia. 1-VI-1996, ex excremento vacuno (1♀, 1♂). Same data except for: 9-VI-1996 (2♀, 4♂). Same data except for: ex frutos podridos (2♂). Same data except for: 10-VI-1996, ex excremento vacuno (1♂). Same data except for: 1 al 30-VII-1995, ex NTP-80 (1♂). Same data except for: 1 al 30-VIII-1995 (1♂, 2♀). Same data except for: 1 al 30-IX-1995 (2♀). Same data except for: 1 al 30-VI-1996 (2♂, 2♀). Tlayacapan, San José de los Laureles. Bosque mesófilo de montaña perturbado, zona 3. 1 al 30-X-1996, ex NTP-80. K. Villavicencio y J. Márquez cols. (1♀). Same data except for: 1 al 30-XI-1995 (1♂). Cuernavaca, Col. del bosque. Bosque de Pino-Encino. 23-VII-1995, ex excremento vacuno, J. Márquez col (1♂). Yauatepec. Carretera México-Cuautla, km. 19. Selva baja caducifolia. 16-VI-1996, ex excremento. J. Márquez col. (1♂, 1♀). Tlayacapan, San José de los Laureles, BMM, 1751 m, 21.VII-24.VIII.1991, J.L. Navarrete y G.A. Quiroz, # 941D, NTP-80, (1♂, 1♀); same data except for: 29.VI.1991, J.L. Navarrete, #677, ex *Boletus edulis* IV (1♂). GUERRERO, 2900 ft. 6 mi El Ocotito. VIII.30-IX.5-1971/ human dung trap 380. A. Newton/ yellow card. *Gastrisus cf. mimetes* Sharp, comp. Holotype A. Newton, 1989/ *Gastrisus* n. sp. det. Newton 1992 (1♂). Same data: (1♀). 9 mi NE Iguala. 1340 m. VIII.29-IX.4-1971 A. Newton coll., human dung trap 378. (3♂, 1♀). 3100 ft. 7.5 mi N El Ocotito. VIII.30-IX.5-1971, human dung trap 381. A. Newton (4♂, 4♀). 9 mi NE Iguala. 4500 ft. VIII.29-IX.4-1971, human dung trap 379. A. Newton (1♂). 3200 ft. 10 mi N El Ocotito. VIII.30-IX.5-1971, human dung trap 382. A. Newton (1♂). 1464 m. 4 mi W Mazatlan. VIII.30-IX.5-1971. A. Newton coll., human dung trap 383 (2♀). 2014 m. 7 mi W Mazatlan. VIII.30-IX.5-1971. A. Newton coll., human dung trap 384 (1♀). Chilpancingo, Guerrero, 4600 ft. June. H.H. Smith/ *Gastrisus mimetes* Sharp/ det. Bernhauer. Godman-Salvin col. 1911. 345/ Sharp colln. By Exchange with Brit. Mus. (N. H.)/ F.M.N.H. [green card]/ *Gastrisus cf. mimetes* det. A. F. Newton 1989. (1). Mochitlan, Acahuizotla, 650 m, tropical subevergreen forest. June-July, 1986. L. Delgado collr. Carrion trap NTP-80, 2 (2♂). Sierra del Alquitrán, BEP, 1670m, 20.VII.1990, ex NTP-80, J. Blackaller y L. Delgado cols. (3♂); same data except for: Encinar tropical, 21.VII.1990, (4♂). JALISCO, Sierra de Manantlán, El Tigre, 18-VII-1988. Selva me-



dia, nocturna, 3;pescado; L. Rivera./ Exchange ex University of Guadalajara, Mex. FIELD MUSEUM/ *Gastrisus* n. sp. det. Newton, 1996 (1♂). Sierra de Manantlán, Mpio. Casimiro Castillo, El Tigre, 700 m, 18-VII-1988. Bosque trop. subcad., L. Rivera leg./ Exchange ex University of Guadalajara, Mex. Field Museum (1♂). Same data except for: G. Andrade col. (1♂). ESTADO DE MEXICO, Nanchititla, 6/Octubre/1995 1540 msnm. Est. 2. Selva Baja Caducifolia, NTP-80-3. A. Morales col. (1♂, 5♀). Same data except for: 1/Agosto/1995. 1110 msnm. Est. 1. Selva Baja Caducifolia, NTP-80-3. A. Morales col. (1♀). Same data except for: 1/Julio/1995. 1540 msnm. Est. 2. Selva Baja Caducifolia, NTP-80-2. A. Morales col. (3♂, 2♀). Same data except for: 26/Agosto/1995. 1110 msnm. Est. 1. Selva Baja Caducifolia, NTP-80-2. A. Morales col. (1♀). Same data except for: 1540 msnm. Est. 2. Selva Baja Caducifolia, NTP-80-1. A. Morales col. (2♂, 2♀). Same data except for: 1/Julio/1995. 1540 msnm. Est. 2. Selva Baja Caducifolia, NTP-80-1. A. Morales col. (2♂, 1♀). Same data except for: 4/Junio/1995. 1110 msnm. Est. 1. Selva Baja Caducifolia, NTP-80-1. A. Morales col. (1♀). Same data except for: 27/Octubre/1995. 1110 msnm. Est. 1. Selva Baja Caducifolia, NTP-80-1. A. Morales col. (1♀). Same data except for: 21/10/95. Est. 2. Selva Baja Caducifolia, NTP-80-2. A. Morales col. (1♂). Same data except for: 27/Oct/95. Est. 2. Selva Baja Caducifolia, NTP-80-2. A. Morales col. (2♀). Holotype, Allotype and some paratypes will be deposited at CZUG, other paratypes will be deposited at FMNH, ENEPI, LEMA, JML, JLN, MHNCM, BMNH, CNC, AMNH, IBUNAM and SEM.

**Etymology.** We are pleased to dedicate this species to our friends and academic supervisors A. F. Newton, Jr., and M.K. Thayer, for their kind help and support in the study of Mexican staphylinids.

*Gastrisus newtonorum* is similar to *G. mimetes* in color pattern, which is probably the reason why Bernhauer misidentified the Mexican specimens as *G. mimetes*. However, *Gastrisus newtonorum* is easily recognized because it has more setiferous punctures on the head and thorax (Fig. 2-3); males with abdominal sternite VII slightly emarginate, sternite VIII emarginate, and primarily by difference in the aedeagus: the paramere is slightly bifurcate at the tip in *G. mimetes*, entire in *Gastrisus newtonorum* (Figs. 4-7, 9). Females are distinguished by the punctuation on the head and thorax.

Our description has some important differences from that provided by Ruiz-Lizárraga (1993): head and thorax black-copper; last two abdominal segments red; elytra with conspicuous impressions; second segment of maxillary palp broader and larger than remaining segments; dorsal pronotal punctures 3:3, sublateral punctures 4:4; aedeagus different from *Gastrisus mimetes*. Specimens we examined don't have that color pattern on the head, thorax and abdomen, and have the last two abdominal segments yellow or rufotestaceous. Also, dorsal pronotal punctuation is inconstant as already mentioned (see Variation).

Specimens of *Gastrisus newtonorum* have been found on several kinds of decomposing organic matter, such as: carrion, fruits, mushrooms [misidentified as *Xenopygus analis* (Er.) by Navarrete-Heredia, 1996], and human and cow dung. As predators they seek prey there, probably maggots and larvae of other beetles. This behavior is similar to that shown by species of *Platydracus*, *Belonuchus*, *Philonthus*, *Styngetus* and other genera common in these habitats.

Most of the specimens were collected in tropical deciduous and sub-evergreen forest during the rainy season (June-November). At present, the highest abundance is recorded from Acahuizotla, Guerrero (Ruíz-Lizárraga, 1993). She examined 173 specimens, 86 males and 87 females, from carrion traps. In this locality this was the second most abundant staphylinid species, after *Belonuchus* aff. *xanthomelas* Solsky. Specimens were collected between June and October. Highest abundance was in July (Fig. 10).

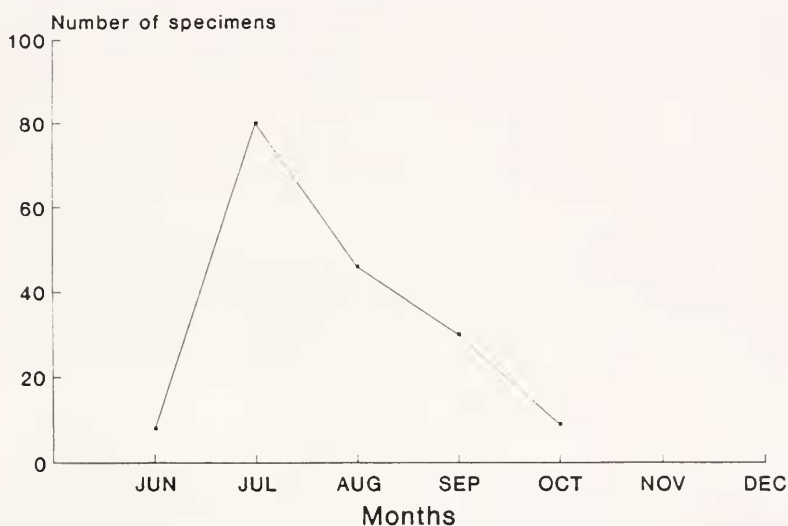


Figure 10. Phenology of *Gastrisus newtonorum* at Acahuizotla, Guerrero.

On the other hand, during a systematic survey of necrophilous staphylinids (in prep. by Márquez) five localities were selected and designated (1. pine-*Quercus* forest, 1,874 m; 2. pine forest, 1,930 m; 3. disturbed cloud forest, 1,783 m; 4. tropical deciduous forest, 1,534; 5. corn field-tropical deciduous forest, 1,634 m). Carrion traps were used for this research and were examined each month. As in Acahuizotla, higher abundance was detected in tropical forest with 23 specimens, whereas in locality 3 only two specimens were collected. No specimens were found at higher elevations in coniferous-*Quercus* forest.

We suspect that, as in Acahuizotla, *Gastrisus newtonorum* is an important predator in tropical forests and probably competes with other predatory staphylinid species of genera such as *Platydracus*, *Belonuchus*, *Philonthus*, *Paederomimus* and others whose phenology is similar.

It is clear that *Gastrisus newtonorum* is primarily distributed in tropical forests, so its abundance is probably higher south to Guerrero and widespread west to Jalisco and east to Oaxaca where tropical forests are common. More

field data on this species and other staphylinids are necessary to get a better understanding of the distributional pattern. The highest altitudinal record is 2030 m; the lowest is 700 m.

In Mexico and Central America, *Gastrisus* species are recorded from Costa Rica (*G. mimetes* Sharp; Blackwelder 1944), Panama (*G. opaculus* Sharp; Blackwelder 1944). It is interesting to note that at present we lack records of any *Gastrisus* species between Mexico and Costa Rica, an unusual pattern for a Xanthopygina species. Is this widely allopatric distribution for *G. mimetes* and *G. newtonorum*, without records for Guatemala, Belize, Honduras, El Salvador and Nicaragua, real? Possibly, but this may be the result of a lack of intensive field work on staphylinids in this area.

Finally, records of *Gastrisus mimetes* from Colombia and Peru require re-examination of the specimens to verify the identifications, or recognize possible misidentifications or new sibling species as was the case for *G. venezolanus*.

Examined specimens of *G. mimetes* from Costa Rica are labeled as: COSTA RICA: Osa Peninsula, Agua Buena, 1 km NW Boscoca centro, 25.VII.1990, Banana plantation, pig dung, leg. K.Vulinec (1♂, 2♀) (FMNH); same data, plus *Gastrisus mimetes* Shp. det Newton 1996 (FMNH); Puntarenas, R.F. Golfo Dulce, 3 km SW Rincon, 10m, V-VI.1992, P. Hanson, *ex malaise*, *Gastrisus* sp. det. J.S. Ashe, 1996 (1♂) (UCR).

#### ACKNOWLEDGMENTS

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